

Remarks

Entry of the following response, as well as reconsideration and withdrawal of the rejections of record, is respectfully requested.

Summary of Status of Amendment and Office Action

In the present amendment, claims 2-4 are canceled, claims 9 and 15 are amended, and no claim is added. Therefore, claims 1, 5, 6, and 9-17 are pending in the application.

In the Office Action dated May 21, 2007, claims 1-3, 9-10 and 12-14 are rejected as obvious over U.S. Patent No. 5,703,174 to Arfaei et al. (hereinafter "Arfaei"), in view of U.S. Patent No. 4,885,127 to Abrutyn et al. (hereinafter "Abrutyn"), and U.S. 6,641,658 to Dubey et al. (hereinafter "Dubey"), and U.S. 3,667,978 to Vassilevsky et al. (hereinafter "Vassilevsky"). Claims 6 and 11 are rejected as unpatentable over these documents, further in view of U.S. 6,930,133 to Albright et al. (hereinafter "Albright"). Claims 1, 4-5, and 15-17 are rejected as obvious over JP 57-057706 to Tsubakimoto et al. (hereinafter "Tsubakimoto"), in view of Abrutyn, Dubey, and Vassilevsky.

Claims 2-4, 6, 9, 11 and 15 are objected to for several informalities.

Applicants point out that the claim amendments herein are solely to address formal matters, and have not been made to overcome the prior art. Thus the amendments should be considered to have been made for purposes unrelated to patentability, and no estoppel should be deemed to attach thereto.

Response to Objections to Claims

Claims 2, 3, and 9 are objected to for reciting the word "type." Claims 2 and 3 are canceled, and claim 9 has been amended by replacing the word "type" with the term "side chains." Support for this amendment, which does not change the scope of the claims, is found within claim 9 itself, as well as throughout the disclosure.

Claim 4 is objected to for reciting the word "partially." This objection is moot as the claim is cancelled. Nevertheless, it is submitted that this term would be understood by the person of ordinary skill in the art.

Claim 15 is objected to because of a typographical error. Applicants thank the Examiner for calling this to their attention. The present Amendment corrects the error by replacing "last" with "least."

Claims 6 and 11 are objected to for reciting the word “apparent.” It is respectfully submitted that this objection is inappropriate because it takes the word out of context — the full term is “apparent specific gravity,” which is a term of art well understood to those of ordinary skill in the art. Even though the rejection does not assert that the term “apparent specific gravity” is indefinite, this point will now be addressed in the interest of advancing the prosecution of this application.

The standard definition for this term can be found from a multitude of sources. One of these is from the website about.com, which defines “apparent specific gravity” as “the specific gravity of a porous solid when the volume used in the calculations is considered to exclude the permeable voids.” For the Examiner’s convenience, a printout of the definition is attached to this Amendment.¹ Moreover, it is pointed out that a search for the term “apparent specific gravity” on the US PTO database of issued patents identifies over 1000 patents employing the term “apparent specific gravity.” Accordingly, it is respectfully submitted that the term “apparent specific gravity” is definite, and would be well-understood to those of ordinary skill in the art.

For all of the above reasons, it is respectfully requested that the objections to pending claims 4, 6, 9, 11 and 15 be reconsidered and withdrawn.

Response to Obviousness Rejections

Claims 1-3, 9-10 and 12-14 are rejected under 35 U.S.C. § 103 as obvious over Arfaei, in view of Abrutyn, Dubey, and Vassilevsky et al. Claims 6 and 11 are rejected as unpatentable over these documents, further in view of Albright. The rejections assert that Arfaei et al. discloses superplasticizers for hydraulic cement compositions, and that the superplasticizer reads on the comb polymer of claim 1, but that Arfaei is silent as to the comb polymer being in the form of a bead, and silent with respect to inorganic and organic fillers. The rejections cite Abrutyn as disclosing comb-like polymers in the form of beads. Abrutyn is the only document relied upon for teaching comb-like polymers in the form of beads.

¹ Obtained from website <http://composite.about.com/library/glossary/a/bldef-a384.htm>, last visited November 15, 2007. This document is submitted as evidence directed to an issue of patentability raised in an Office action. Accordingly, payment of a fee should not be necessary for consideration of this document. See M.P.E.P. §609C(3). However, if any fee is believed to be necessary for consideration of this document, this should be considered express authorization to charge appropriate fees to Deposit Account No. 19-0089.

As an initial matter, it is respectfully submitted that the rejection does not establish a *prima facie* case of obviousness, as the person of ordinary skill in the art would not combine Arfaei and Abrutyn. Indeed, as explained below, Arfaei actually teaches *against* the combination with Abrutyn.

As indicated in the rejection, the comb-like polymers of Arfaei are not in the form of beads. It is submitted that this is so because the polymers of Arfaei are water soluble – they are shown to be prepared in aqueous solution (see Arfaei at col. 8, lines 4-7), and are then used in aqueous solution (see Arfaei at col. 8, lines 29-36). In contrast, the comb-like polymers of Abrutyn are indicated to be cross-linked polymers (see, e.g., Abrutyn, Abstract and col. 1, lines 17-19, and col. 2, lines 17-19), which would indicate to those of ordinary skill in the art that the Abrutyn polymers are water *insoluble* (see, e.g., Abrutyn at col. 11, lines 60-64, referring to “the water in which the polymerization system was *suspended*.”) (emphasis added)). One of ordinary skill in the art would not be motivated to replace the non-cross-linked water soluble polymer of Arfaei with the cross-linked water *insoluble* polymers of Abrutyn, because the fundamentally different properties of the polymers render them non-exchangeable in aqueous mixtures.

Moreover, Dubey and Vassilevsky, and Albright are cited for whether or not one having ordinary skill in the art would combine the diverse disclosures of each of these documents. Dubey, Vassilevsky, and Albright do not disclose or suggest comb-like polymers in the form of beads.

Thus, none of the other cited documents cures or compensates for the fact that Arfaei teaches against combinations with Abrutyn.

Yet further, Albright is cited for its disclosure of beads having a specific gravity from about 0.2 to about 0.9, but a plain reading of the document shows that these are not *apparent* specific gravities (which as discussed above, is a term of art, and excludes pore volume), but ordinary specific gravities (which includes pore volume). Indeed, Albright expressly obtains its low specific gravities by incorporating pores into the beads. See Albright at Abstract (“... in the presence of a porogen.”), col. 1, lines 54-55 (“... in porous, spherical bead form . . .”), as well as in numerous other places throughout the document. Thus, the numbers from Albright cited in the rejection are not “apparent specific gravity” values.

Because Arfaei actually teaches *against* combination with Abrutyn, and because none of the other cited documents disclose or suggest comb-like polymers in bead form, it is respectfully
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submitted that this rejection does not establish a *prima facie* case of obviousness. Accordingly, it is respectfully requested that this rejection be reconsidered and withdrawn.

Moreover, Applicants have shown unexpected results over spray-dried polymers and dissolved polymers sufficient to overcome a *prima facie* case of obviousness even if present. In particular, one of ordinary skill in the art might expect that providing the comb-like polymer in bead form would reduce its efficiency compared to providing it in liquid form. Applicants have made the surprising discovery that the efficiency of the polymer in bead form is the same as that when the polymer is in liquid form, and also that maximum efficiency is obtained with shorter mixing times. See Paragraphs [0083] to [0085] of the published application.

Claims 1, 4, 5, and 7-15 are rejected under 35 U.S.C. § 103 as obvious over Tsubakimoto in view of Arbutyn, Dubey and Vassilevsky. The rejection asserts that Tsubakimoto discloses comb shaped copolymers that can be used as a dispersing agent for pigment, as a builder for detergent, and as a cement mixing additive. The rejection acknowledges that Tsubakimoto is silent with respect to the comb polymer being in the form of a bead, and with respect to addition of inorganic and organic filler.

This rejection does not assert a *prima facie* case of obviousness at least for the same reasons as discussed above with respect to the rejection over Arfaei. Indeed, Tsubakimoto discloses even less than Arfaei, such that the rejection over Tsubakimoto is even more tenuous than that over Arfaei. For example, Tsubakimoto does not even clearly indicate whether the disclosed polymers are or are not cross-linked (although the reference to their use as chelating agents suggests the possibility that they may be cross-linked). Accordingly, it is respectfully submitted that the rejection over Tsubakimoto does not establish a *prima facie* case of obviousness.

Moreover, as discussed above with respect to Arfaei, Applicants have shown unexpected results over spray-dried polymers and dissolved polymers sufficient to overcome an obviousness rejection.

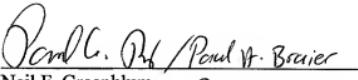
Accordingly, even had the rejection established a *prima facie* case of obviousness (which Applicants maintain is not the case), Applicants have nonetheless provided sufficient unexpected results to overcome such the rejections. Accordingly, it is respectfully requested that these grounds of rejection be reconsidered and withdrawn.

Conclusion

For the reasons advanced above, Applicants respectfully submit that all pending claims patentably define Applicants' invention. Allowance of the application with an early mailing date of the Notices of Allowance and Allowability is therefore respectfully requested.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed telephone number.

Respectfully submitted,
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Apparent Specific Gravity

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Definition: The specific gravity of a porous solid when the volume used in the calculations is considered to exclude the permeable voids. See also [SPECIFIC GRAVITY](#).

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